

Pseudo Rational ABM Expectations

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Expectations Hypothesis (REH) by Lucas and Prescott, rational expectations have become the standard in macroeconomic modeling. The REH necessitates that the subjective probability distributions of economic agents coincide with the objective distributions governing the economic system. Even more recent and alternative views on expectation formation, such as adaptive learning take full rationality either as something that can be achieved through learning or as the benchmark against which other forms of expectations should be assessed. In complex evolving Agent-Based Models (ABMs), implementing rational expectations is not feasible due to the absence of an analytically closed-form solution in the model and the presence of structural breaks in the underlying distributions. This poses difficulties because the conditional expectations of the true data-generating process might not be analytically characterized or consistently predicted in general. We enrich the modeling of expectations in agent-based models by introducing Pseudo Rational ABM Expectations. The basic idea of the Pseudo Rational ABM expectations is to use the “true model” of the economy to perform forecasting, analogously to Muth’s hypothesis. More precisely, the novel expectations are given by a recursive forecasting method, whereby the agents, aware of the feedback loop between expectations and the system dynamics, revise their expectations iteratively by foreseeing the future state variables at each step. The new expectations are implemented in the Keynes meeting Schumpeter model and compared with static naïve expectations. We find that the sophisticated expectations imply perfect foresight, boosting the firm-level performance of the adopters. Nevertheless, introducing one forward-looking firm only deteriorates the macroeconomic dynamics, which gets more volatile and unstable.